

Notice of Allowability

Application No.

10/725,706

Examiner

Kretelia Graham

Applicant(s)

KUMAR ET AL.

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 1/8/07.
2. ☒ The allowed claim(s) is/are 1-17 and 21.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 3/29/07.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other copy of supplemental amendment.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with James Eakin on 3/28/2007.

The application has been amended as follows:

Claims 18-20 have been cancelled.

The following claims have been amended:

1. (Currently Amended) A magnetic mass storage memory device comprising: a) a read layer having an array of read heads; b) a storage layer having an array of magnetic storage elements wherein the read heads are associated with at least one storage element on the storage layer; c) a control circuit to select the desired storage element that controls an orientation of a magnetic field of an associated read head, and d) at least one pair of write lines disposed one on either side of the magnetic storage elements and controlled by the control circuit for effecting a change in the orientation of a selected storage element.

2. (Currently Amended) The memory device according to claim 1, wherein the read head comprises: a) a pinned layer; and b) a first free layer.

4. (Currently Amended) The memory device according to claim 3, wherein the first free layer has a variable magnetic orientation.

8. (Currently Amended) The memory device according to claim 7, wherein a resistance of the associated read head is indicative of a value stored therein.

9. (Currently Amended) The memory device according to claim 8, wherein the associated read head is an MR.

10. (Currently Amended) The memory device according to claim 8, wherein the associated read head is a GMR.

11. (Currently Amended) The memory device according to claim 8, wherein the associated read is a CMR.

12. (Currently Amended) A magnetic mass storage memory device comprising:
a) a read layer having an array of read heads, each read head comprising a plurality of magnetic layers; b) a storage layer having a plurality of conductive lines arranged in at least one pair with an array of magnetic storage elements disposed between the

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conductive lines in locations corresponding to the read heads; and c) a control circuit to select a desired storage element from the array of magnetic storage elements such that a current through the conductive lines will induce a magnetic field in the selected storage element wherein the induced magnetic field controls a direction of a magnetic field of at least one layer in the plurality of magnetic layers in the corresponding read head.

13. (Currently Amended) The memory device according to claim 12, wherein the plurality of magnetic layers comprises: a) a pinned layer; and b) a first free layer.

15. (Currently Amended) The memory device according to claim 14, wherein the direction of the magnetic field of the first free layer is variable.

16. (Currently Amended) The memory device according to claim 15, wherein the magnetic storage element comprises a second free layer.

17. (Currently Amended) The memory device according the claim 16, wherein a direction of a magnetic field of the second free layer is regulated by a current through the plurality of conducting lines.

21. (Currently Amended) A method of magnetic reading on a storage device comprising the steps of: a) selecting a magnetic storage element, from an array of

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magnetic storage elements on a storage layer; b) passing current through conducting lines surrounding the magnetic storage element, the conductive lines arranged in at least one pair; c) inducing a magnetic field around the magnetic storage element by the current through the conducting lines; d) setting the direction of magnetization of a second free layer in the storage element and controlling a direction on the magnetization of a free layer in a read head associated with the storage element from an array of read heads on a read layer by the induced magnetic field; and (e) measuring a resistance of the associated read head.

Allowable Subject Matter

2. Claims 1-17 and 21 are allowed. The following is an examiner's statement of reasons for allowance: the prior art of record considered pertinent to the applicant's disclosure, whether taken individually or in combination, does not teach or suggest: a read layer having an array of read heads, storage layer having an array of magnetic storage elements with each read head being associated with a storage element, and at least one pair of write lines disposed on either side of the storage elements for causing a change of magnetization direction of a selected storage element (**see claims 1, 12, and 21**)

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kretelia Graham whose telephone number is (571) 272-5055. The examiner can normally be reached on Mon-Fri 8am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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